Space Weather Forecast

Issued on Thursday, 14 April 2022 at 13:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1 Minor to G2 Moderate geomagnetic storm day 1 and perhaps day 2 (14th and 15th) due to CME arrival.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been very low with no flares observed, although there have been signs of increasing activity as potential regions from the far side approach. There are three sunspots on the disc, however these are all currently small and simple. No Earth-directed coronal mass ejections (CMEs) have been observed.

Solar Wind / Geomagnetic Activity: The solar wind has remained slightly elevated, with Earth exiting the tail end of one CME, and soon entering another. This was an early arrival of the CME expected later on the 14th, which left the Sun on the 11th. The magnetic field carried by the wind was remained weak to moderate in strength, but with a period of having its north-south component in the negative (southward) direction 14/0000-0920 UTC. This resulted in the initially Quiet to Unsettled geomagnetic activity becoming Active with a G1/Minor Storm interval observed 14/0900-1200 UTC

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Very Low to Low. The three sunspot regions on the disc are small, and only showing limited growth, however activity from the far-side is increasingly likely to affect the Earth as it rotates near to and onto the near-side through the period.

Solar Wind / Geomagnetic Activity: Earth is likely within the CME which left the Sun on the 11th, with ongoing affects forecast day 1 and into day 2 (14th and 15th). Enhanced solar winds are then forecast to ease before a further enhancement from the arrival of the fast wind of a coronal hole is forecast day 3 (16th), although this is low confidence. No further CME arrivals are expected. Geomagnetic activity is forecast to be Quite to Active, but likely increasing to G1 Minor to G2 Moderate Storm at times day 1 and perhaps day 2 (14th and 15th). Mostly Quiet to Unsettled conditions returning through day 2, but perhaps increasing to Active to G1 Minor Storm with any arrival of faster solar winds, most likely day 3 (16th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	100	30	20	5
Strong	G3	No	5	2	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	2	5	5	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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